Testimony of
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I.Introduction

Chairman Walden, Ranking Member Eshoo, and Members of the Subcommittee, thank you for the opportunity to testify on behalf of the National Telecommunications and Information Administration (NTIA) regarding federal agencies' use of spectrum. NTIA, an agency within the Department of Commerce, is the President's principal advisor on telecommunications and information policy matters and manages the federal agencies' use of radio spectrum.

As Associate Administrator for NTIA's Office of Spectrum Management, I oversee NTIA's federal spectrum management operations, including all frequency assignment, engineering, and spectrum planning and policy functions. It is a privilege to serve in this capacity and I am pleased to appear today to discuss federal use of the radio spectrum and NTIA's substantial and multi-pronged efforts to identify spectrum for wireless broadband use while ensuring the ability of federal agencies to fulfill their challenging missions.

II.Moving Forward to Make Additional Spectrum Available for Commercial Broadband Use

It is hard to overstate the importance of radio frequency spectrum to our nation's economy and its impact on virtually every aspect of our society. Increasing commercial use of wireless spectrum for broadband is transforming multiple areas of the U.S. economy, including small businesses creation, productivity, employment, consumer welfare, health care, government services, and public safety. Research studies suggest that increased investment in new wireless broadband networks will boost national income,[1] significantly expand GDP growth,[2] and create hundreds of thousands of new jobs.[3] A study commissioned by CTIA (the wireless industry trade association) estimated that the productivity gains from wireless broadband adoption result in nearly $100 billion in annual cost savings in the United States.[4] Recently, an expert working group of the President's Council of Advisors on Science and Technology (PCAST) – ably represented here today by Dr. Marshall – estimated that increasing the availability of spectrum for wireless broadband could yield social benefits of over $1 trillion and create millions of American jobs over many years.[5]

Spectrum is vital to enabling federal agencies to perform their essential missions, as it supports national security, critical defense operations, law enforcement, homeland security, transportation safety, scientific research, environmental monitoring, power marketing and weather prediction. As set forth more fully in General Wheeler's testimony, federal radio and radar systems have been indispensable to fighting the war on terror, eliminating Osama Bin Laden and preparing for future threats and military conflicts. Weather radar and satellite communications systems are critical to our ability to accurately project and monitor hurricanes and to help our citizens to prepare for weather emergencies. Air traffic control radar and radio systems are vital to ensuring that the American public flies safely, supporting an ever-improving flight safety record in the face of an increasing number of flights. Federal radio communications helped put Neil Armstrong on the moon and, more recently, set Curiosity to work on Mars.

Recognizing the importance of jumpstarting additional investment in wireless broadband, the President has taken decisive action to ensure that American businesses and entrepreneurs could continue to meet the skyrocketing demand. In June 2010, the President directed the Department of Commerce, working through NTIA, to collaborate with the Federal Communications Commission (FCC) to make available an additional 500 megahertz of spectrum for commercial wireless broadband use by 2020.[6] Since then, NTIA and other federal agencies have had our noses to the grindstone, determined to find the spectrum necessary to make these economic, technological and societal benefits a reality. In particular, we have been working closely with federal and non-federal stakeholders to explore all options for making additional spectrum available to commercial providers, licensed and unlicensed uses, clearing bands currently used by federal agencies, and sharing spectrum where technology and other factors permit.

In November 2010, soon after receiving the President's assignment, NTIA identified 2,200 megahertz of spectrum for evaluation. We have since added another 195 megahertz in the 5 GHz range to this list of candidate bands. Also in 2010, NTIA led an interagency "fast track" evaluation of certain bands that could be reallocated without requiring relocation of federal systems and recommended reallocating 115 megahertz in the 1695-1710 MHz and 3550-3650 MHz bands for wireless broadband use on a shared basis.[7]

As the FCC undertook its responsibility of determining how and when to make that 115 megahertz available, NTIA and the other agencies pressed forward to take on the substantial challenge of evaluating the 95 megahertz in the 1755-1850 MHz band, recognizing that the lower 25 megahertz is the most appealing to commercial carriers. With current federal uses in that band ranging from point-to-point microwave to covert law enforcement surveillance, drone control, and air combat training systems – where radio antennae are literally conformed to the skin of the aircraft – the critical and complex missions performed by federal agencies in the 1755-1850 MHz band have required systems of greater and greater sophistication and have increased the agencies' own needs for spectrum. The opportunities to find spectrum in which to relocate federal operations are dwindling rapidly as many of these missions, especially airborne systems, require high mobility, small size and, in some cases, the ability to access the spectrum internationally.

In a report to the President in March 2012, NTIA determined that the full 95 megahertz of this prime spectrum band could be repurposed for wireless broadband use once certain critical challenges are overcome.[8] Based on preliminary estimates from the 20 agencies that have more than 3,100 individual frequency assignments in this band, this report projected that completely clearing all of these federal users would take at least ten years and cost approximately $18 billion. Together with our agency partners, we concluded that the best and most fiscally responsible, long-term approach to this band is to evaluate the entire 95 megahertz of the band, and not some smaller portion, because many federal systems require access across the entire band to carry out their missions. Furthermore, reaching the goal of 500 megahertz will require larger steps. The extraordinary cost and time estimates identified in the report, while preliminary, compel us to explore a broader, more innovative, more aggressive approach to making the band, or some substantial portion thereof, available for commercial broadband use.

III.Spectrum Sharing, Combined with Traditional Relocation, Will Help Address Spectrum Needs

In light of the significant challenges in repurposing the 1755-1850 MHz band, NTIA is pursuing, with our industry and federal agency stakeholders, a new and innovative path forward that could allow us to make this band available faster and at a lower cost than would be possible under a traditional, relocation-only process, while still protecting critical federal missions. Such an approach relies on a combination of relocating federal users where feasible and affordable, and sharing spectrum between federal agencies and commercial users where possible and practical. By accounting for the unique requirements of each federal mission, along with recent innovation in commercial technology, a tailored approach that employs a combination of relocation and sharing may provide the best way to achieve: (1) faster entry by commercial services; (2) substantially lower costs for the taxpayer; (3) more available spectrum due to efficiencies; and (4) greater innovation in the wireless marketplace.

Today, NTIA is fully engaged to make this happen. NTIA's Commerce Spectrum Management Advisory Committee (CSMAC) has organized several working groups, made up of experts from industry and government

– an example of the public/private cooperation this Administration has favored – to evaluate all the different federal uses and the prospective commercial technology and to determine the fastest, most cost-effective way forward to allow commercial broadband access. In many cases, we expect that traditional relocation will be the CSMAC's recommendation. Systems such as point-to-point microwave circuits, for example, are relatively straightforward to move. Within this band, these are among the least costly systems to relocate, as both the necessary equipment and alternative spectrum is available. In other cases, such as federal satellite earth stations, the working groups are evaluating how to better define geographic protection and coordination zones as a way of allowing commercial access in large parts of the country. It is not possible to relocate these critical satellite control links to new bands in the near future because they support satellites already launched.

In addition to the relocation and geographic sharing options, the CSMAC working groups are considering a third option – the possibility that commercial users and the federal agencies can have access to the same frequencies in the same geographic areas through greater spectrum availability and the use of today's new commercial technologies, which possess flexibility, agility and growing acceptance by international standards development organizations such as the 3rd Generation Partnership Project (3GPP). While significant technical and policy challenges lie ahead, sharing would allow for more efficient use of this spectrum, could match intermittent government use with other valuable uses, and may reduce the uncertainties and disruptions to agency missions that result from the constant threat of relocating again in the future. The CSMAC working groups are currently hard at work analyzing the available information, and we expect to receive these findings in early 2013. We very much appreciate the working group members' service and active participation.

Another example of the collaboration among federal and non-federal entities to find win-win solutions for the nation's spectrum needs can be seen in NTIA and the Defense Department's (DOD) support of the wireless industry's monitoring, analysis and testing efforts. T-Mobile USA, on behalf of the wireless industry, recently received experimental authorization from the FCC to engage in a pilot program to test sharing approaches to determine the feasibility of sharing the 1755-1850 MHz band with select categories of DoD systems. Additionally, Verizon has committed $5 million to further testing of spectrum sharing approaches. NTIA strongly supports these types of collaborative efforts between federal agencies, the wireless industry and other wireless technology innovators. They are critical to driving this process forward, as quickly as we can, toward successful outcomes for all stakeholders.

The combined efforts of NTIA, federal agencies and industry to pursue spectrum clearing and sharing, along with the critical efforts of the FCC to conduct incentive auctions, will result in tremendous progress towards the goals we all share of maximizing the availability of commercial spectrum for wireless broadband uses.

IV.Unlicensed Devices in the 5 GHz Band

Pursuant to Section 6406(b) of the Middle Class Tax Relief and Job Creation Act of 2012 (Tax Relief Act), NTIA and the federal agencies have begun to evaluate known and proposed spectrum-sharing technologies and the risks to federal users if Unlicensed-National Information Infrastructure (U-NII) devices are allowed to operate in the 5350-5470 MHz band and in the 5850-5925 MHz band. This additional 195 megahertz of spectrum holds the potential to expand significantly the bandwidth available for unlicensed broadband devices, which often provide a link to the Internet while enabling service providers to offload traffic from their licensed wireless networks, thus easing network congestion. We have held discussions with device manufacturers regarding these potential expansion bands as well as technical and regulatory options for addressing ongoing interference issues in other parts of the 5 GHz band.

In October, NTIA will complete a study of the 5350-5470 MHz and 5850-5925 MHz bands in accordance with the Tax Relief Act. Based on this study and further quantitative analyses, NTIA, the FCC and the federal agencies will need to work cooperatively with industry representatives to fully assess the conditions under which sharing is or is not possible in those bands and to mitigate the identified risks to authorized systems. As the Tax Relief Act requires, the FCC and NTIA must determine that licensed users will be protected by technical solutions and that the critical missions of federal spectrum users will not be compromised by unlicensed use in these bands. In addition, NTIA will also need to collaborate with the Department of State to address the international dimensions and ramifications of these issues.

V.Spectrum Sharing Research and Testing

The Administration has also moved forward to facilitate research, development, experimentation, and testing of innovative spectrum-sharing technologies. The Wireless Spectrum R&D Senior Steering Group (SSG) held three workshops between 2011 and July 2012 with the goal of identifying promising projects whose implementation will significantly advance progress in this area. The Senior Steering Group has also identified the federal research programs developing new sharing technologies and providing critical test capabilities. The most recent workshop held this summer in Boulder, Colorado, provided the opportunity for participants to review proposals for projects that would address the challenges identified by Congress, the FCC, NTIA, and the WSRD to make spectrum sharing technologies more available to all sectors of the wireless community.

VI.Incentives for the Relocation of and Sharing with Federal Users

The recent enactment of the Tax Relief Act will also play an important role in providing the incentives and means for federal agencies to relocate from or share their existing spectrum bands. I want to thank the members of this Subcommittee and their staff for their substantial efforts and support to include key spectrum management reforms. The improvements made by Congress to the Commercial Spectrum Enhancement Act (CSEA) will allow agencies to recover costs for, among other activities, planning for the reallocation and/or sharing of spectrum, and implementing reallocation and/or spectrum sharing arrangements. They also open the door to agencies' upgrading their systems with state of the art technology and other technology or commercial platforms. Other improvements in the new law are aimed at facilitating better transparency, coordination, and predictability for bidders in FCC spectrum auctions and the ultimate winners of those auctions through, for example, a new requirement that NTIA publish agencies' spectrum transition plans on its website at least 120 days before the commencement of the corresponding FCC auction, with the exception of classified and sensitive information.

NTIA has been working with the Office of Management and Budget, the FCC and other federal agencies to implement these provisions well before the FCC announces the next auction of reallocated federal spectrum bands. NTIA's objectives in this effort are to ensure the accuracy and sufficiency of agency transition plans, assure sufficient and timely funding to pay for and implement such plans, reduce risk and uncertainty in the auction and transition process, and avoid interruption or adverse impact to federal agencies' operations. New NTIA guidelines and regulations develop a common format for agency transition plans, establish a mechanism to review the sufficiency of such plans by an expert Technical Panel, and create a fair and efficient dispute resolution process for addressing disagreements that may arise over the execution, timing, or cost of transition plans.

VII.Conclusion

NTIA and the federal agencies have made substantial progress toward fulfilling the President's goal of doubling the amount of commercial wireless spectrum available this decade, and are excited by the strong momentum that today is driving our efforts. Indeed, our success is critical to enable businesses to grow faster and create more jobs, improve education and job training, enhance public safety, and encourage innovation and economic growth. To date, NTIA has put on the table 210 megahertz of additional federal spectrum to reallocate for commercial use. Together with similar efforts by the FCC, collaboration with industry, and the authority that Congress provided to the Commission to conduct incentive auctions, we are well on our way to achieving this success.

I appreciate the opportunity to testify before you today and welcome your questions.

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[1] *See, e.g.,* Pearce, Alan and Pagano, Michael, *Accelerated Wireless Broadband Infrastructure Deployment: The Impact on GDP and Employment,* Media Law and Policy, (2009), *available at*:

http://www.nyls.edu/user_files/1/3/4/30/84/187/245/Pearce%20&%20Pagano,%20SPRING%202009%20&%20Pagano,%2018%20MEDIA%20L.%20&%20POL%E2%80%99Y.pdf [2].

[2] Deloitte Development, LLC, *The impact of 4G technology on commercial interactions, economic growth, and U.S. competitiveness* (Aug. 2011), *available at*: http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/TMT_us_tmt/us_tmt_impactof4g_edited060612.pdf [3].

[3] *See, e.g.,* Crandall, R. and Singer, H., *The Economic Impact of Broadband Investment*," (Feb. 23, 2010), released by the Broadband for America coalition, *available at:* http://www.ncta.com/DocumentBinary.aspx?id=880 [4]; *See also*, Sosa, D. and M. Van Audenrode, *Private Sector Investment and Employment Impacts of Reassigning Spectrum to Mobile Broadband in the United States,* Analysis Group, Inc. (Aug. 2011).

[4] Entner, Roger, *The Increasingly Important Impact of Wireless Broadband Technology and Services on the U.S. Economy* (2008), *available at:* http://files.ctia.org/pdf/Final_OvumEconomicImpact_Report_5_21_08.pdf [5].

[5] "Realizing the Full Potential of Government-Held Spectrum to Spur Economic Growth," Report to the President by the President's Council of Advisors on Science and Technology (July 2012), at http://www.whitehouse.gov/sites/default/files/microsites/ostp/pcast_spectrum_report_final_july_20_2012.pdf [6].

[6] Memorandum for the Heads of Executive Departments and Agencies, *Unleashing the Wireless Broadband Revolution* (Jun. 28, 2010), *available at:* http://www.whitehouse.gov/the-press-office/presidential-memorandum-unleashing-wireless-broadband-revolution [7].

[7] National Telecommunications and Information Administration, *Plan and Timetable to Make Available 500 MHz of Spectrum for Wireless Broadband* (Nov. 15, 2010), *available at:* http://www.ntia.doc.gov/reports/2010/TenYearPlan_11152010.pdf [8].

[8] National Telecommunications and Information Administration, *An Assessment of the Viability of Accommodating Wireless Broadband in the 1755 – 1850 MHz Band* (March 27, 2012), *available at:* http://www.ntia.doc.gov/files/ntia/publications/ntia_1755_1850_mhz_report_march2012.pdf [9].